






Sodium chlorate(I)

also known as Sodium hypochlorite

| Substance | Hazard | Comment |
|---|---|---|
| Note that <i>solid</i> sodium chlorate(I) does not exist. Sodium chlorate(I) is NaOCl; do not confuse it with sodium chlorate(V), NaClO ₃ , or sodium chlorate(VII), NaClO ₄ . | | |
| Concentrated sodium chlorate(I) Solution (if more than 0.7 M or more than 5% (w/v) available chlorine) |   CORROS. ENVIRON. | DANGER: causes severe burns and eye damage, similar to sodium hydroxide solution. It is toxic to aquatic life. It produces a toxic gas (chlorine) with acids. Pressure may build up in bottles during storage, due to slow decomposition. It removes the colour from many dyes. |
| Moderately-dilute sodium chlorate(I) Solution (if less than 0.7 M but 0.4 M or more; between 5% and 3% (w/v) available chlorine) |   CORROS. ENVIRON. | DANGER: causes severe eye damage; irritating to skin. It is toxic to aquatic life. It produces a toxic gas (chlorine) with acids. This includes most domestic bleach. It removes the colour from many dyes. |
| Dilute sodium chlorate(I) Solution (if less than 0.4 M but 0.15 M or more; between 3% and 1% (w/v) available chlorine) |  IRRITANT | WARNING: irritating to eyes and skin. Microbiological spills can be dealt with using a 10% solution diluted 100 times (ie, 0.1%), but it is quickly made inactive by organic matter and so a 10 times dilution (ie, 1%) is often preferred. |
| Very dilute sodium chlorate(I) Solution (if less than 0.15 M; less than 1% (w/v) available chlorine) | LOW HAZARD | Microbiological spills can be dealt with using a 10% solution diluted 100 times (ie, 0.1%), but it is quickly made inactive by organic matter and so a 10 times dilution (ie, 1%) is often preferred. |

Note: Available chlorine

Sodium chlorate(I) is normally made by reacting chlorine gas with sodium hydroxide solution. Sodium chloride is produced as a by-product and this is left mixed in the solution. So only part of the chlorine in the mixture (the Cl in the NaOCl but not the Cl in the NaCl) is available for oxidising or bleaching purposes. One gram of a 10% available chlorine bleach has the same bleaching power as 0.1 gram of pure chlorine.

Typical control measures to reduce risk

- Use the lowest concentration possible.
- Use the smallest volume possible.
- Wear eye protection, including when making or disposing of solutions.
- Wear protective gloves if the concentrated solution is handled on anything larger than a test-tube scale.
- Never mix domestic bleach with other household cleaners, because these could be acidic.

Assessing the risks

- **What are the details of the activity to be undertaken? What are the hazards?**
- **What is the chance of something going wrong?**
eg hazardous products of reaction (such as chlorine gas) are formed if sodium chlorate(I) is mixed with acid.
- **How serious would it be if something did go wrong?**
NB Alkali in the eye causes more damage than acid of equivalent concentration.
- **How can the risk(s) be controlled for this activity?**
eg, can it be done safely? Does the procedure need to be altered? Should goggles or safety spectacles be worn?

Emergency action

- **In the eye** Flood the eye with gently-running tap water for 20 minutes. Consult a medic. If a visit to hospital is necessary, continue washing the eye during the journey in an ambulance.
- **Chlorine breathed in** Remove the casualty to another room to rest. Consult a medic.
- **Swallowed** Do no more than wash out mouth with drinking water. Do **not** induce vomiting. Consult medic.
- **Spilt on the skin or clothing** Remove contaminated clothing. Drench the skin with plenty of water. If a large area is affected or blistering occurs, consult a medic. Rinse contaminated clothing with water.
- **Spilt on the floor, bench, etc** Wipe up small amounts with a damp cloth and rinse it well. For larger amounts, open the windows and, especially for quite-concentrated solutions, cover with mineral absorbent (eg, cat litter) and scoop into a bucket. Rinse with plenty of water.